## REMARKS

Claims 1, 2, 4, 5 and 7-20 are presently pending in the subject application. Claims 1-20 have been examined, and claims 21-36 have been withdrawn from consideration as nonelected claims based upon a previous restriction requirement. Applicant affirms an election was made without traverse to the Examiner's restriction requirement by telephone, with claims 1-20 (Group I) being elected for prosecution on the merits.

Claims 1-11, 15-18 and 20 stand rejected, and claims 12-14 and 19 are objected to. By the above amendments, claims 1 and 20 have been amended, and claims 3, 6 and 21-36 have been canceled without any prejudice or disclaimer of the subject matter thereof. Applicant expressly reserves the right to file divisional and/or continuation applications with respect to the subject matter of claims 21-36. Favorable reconsideration of the application and allowance of all of the pending claims are respectfully requested in view of the above amendments and the following remarks.

Initially, it is noted that claims 12-14 and 19 are objected to as being dependent upon a rejected base claim. Applicant appreciates and acknowledges the Examiner's indication that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 stands rejected under 35 U.S.C. § 112, 2nd paragraph, as being indefinite because of the terms Nonidet P-40 and Poloxamer 188. Applicant traverses this rejection and respectfully submits that one having ordinary skill in the art will readily recognize the chemical compounds associated with these terms. However, in order to further clarify the meaning of these terms, the specification has been amended to identify the specific chemical compounds associated with Nonidet P-40 and Poloxamer 188. It is respectfully submitted that one having ordinary skill in the art at the time of the invention would readily recognize that NP-40 and Poloxamer 188 are trade names associated with these chemical compounds, such that the specific reference of these compounds in the specification does not constitute new matter. It is further submitted that these terms are clear and definite, particularly in light of the specification as amended, and the Examiner is requested to withdraw the rejection of claim 7 under 35 U.S.C. § 112, 2nd paragraph.

Claims 1-6, 17 and 20 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Bonard et al. ("Purification and Size-

Selection of Carbon Nanotubes") with Allen ("Emulsions") to show a state of fact. In addition, claims 1 and 8 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Chen et al. ("Cyclodextrin-Mediated Soft Cutting of Single-Walled Carbon Nanotubes"); claims 1 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu et al. ("Fullerene Pipes") in view of the Sigma Product Information Sheet the Examiner has made of record for Triton X-100 to show a state of fact; claims 1, 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,853,877 to Shibuta; claims 9-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen et al.; and claim 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bonard et al. as applied to claims 1 and 17, and further in view of de Heer et al. ("Aligned carbon nanotube films . . ."). Applicant respectfully traverses the rejections of these claims as applied to the amended claims and in view of the following remarks.

Amended claims 1 and 20 recite methods for isolating or purifying single walled carbon nanotube structures by mixing the structures in a solution including an effective amount of a dispersal agent, where the dispersal agent is selected from the group consisting of detergents having a hydrophilic-lipophilic balance value no greater than about 13.2, deoxycholates, taurocholic acid, cyclodextrins, chaotropic salts, poloxamers, sapogenin glycosides, ion pairing agents, and combinations thereof. It is respectfully submitted that none of the cited references relied upon by the Examiner disclose or suggest the combined features of amended claim 1 or amended claim 20.

Regarding the rejection of claims 1 and 8-11 as being anticipated or rendered obvious by Chen et al., Applicant submits herewith two Declarations under 37 C.F.R. § 1.131, executed by the inventors of the subject application. These Declarations establish that the claimed invention was conceived and reduced to practice prior to March 6, 2001 (i.e., prior to the dates in which the Chen et al. reference was both received and published on the Web). Accordingly, the Chen et al. reference does not satisfy the requirements of 35 U.S.C. § 102(a), and the Examiner is requested to withdraw the rejections of these claims based upon this reference.

Regarding the rejection of claims 1 and 20 based upon Bonard et al., Bonard et al. discloses the use of sodium dodecyl sulfate (SDS) to obtain metastable nanotube suspensions. Bonard et al. briefly discloses in a footnote (footnote 19 at page 831) that two other surfactant solvent solutions were also considered: a mixture of water and ethanol with Synperonic NP10,

and tetradecane with Span 80. However, Bonard et al. further indicates (footnote 19) that satisfactory results were not obtained with Span 80.

Bonard et al. does not disclose or suggest a dispersal agent capable of substantially dispersing single walled carbon nanotubes in a solution as recited in amended claims 1 and 20. In particular, neither SDS nor Synperonic NP 10, as disclosed in Bonard et al., meet the recited limitation in claims 1 and 20 of a dispersal agent selected from the group consisting of detergents having a hydrophilic-lipophilic balance value no greater than about 13.2, deoxycholates, taurocholic acid, cyclodextrins, chaotropic salts, poloxamers, sapogenin glycosides, ion pairing agents, and combinations thereof.

Further, while Span 80 appears to have an HLB value of 4.3, as noted by the Examiner and as indicated by the Allen reference, Bonard et al. clearly indicates that the Span 80 / tetradecane mixture considered in the study did not yield satisfactory results. Therefore, it is unreasonable to assert that Span 80 meets the limitation of a detergent having a hydrophilic-lipophilic balance value no greater than about 13.2 and is provided in an effective amount within a solution to substantially disperse single walled carbon nanotube structures in the solution as recited in claims 1 and 20. Accordingly, claims 1-6, 17 and 20 are considered to be in condition for allowance, and the Examiner is requested to withdraw the rejection of these claims as being anticipated or obvious based upon the teachings of Bonard et al.

Claim 18 is also considered to be allowable in light of the previous remarks, and the Examiner is requested to withdraw the rejection of this claim as being obvious based upon Bonard et al. in view of de Heer et al.

Liu et al. discloses the formation of stable colloidal suspensions of nanotube material with the assistance of SDS or Triton X-100 (TX-100). The Examiner rejects claims 1 and 7 as being obvious over Liu et al. in view of the Sigma Product Information Sheet for TX-100. In particular, the Examiner asserts that, since the Sigma Product Sheet indicates that TX-100 has a structure similar to NP-40 and the names are sometimes reported as synonyms, it would have been obvious to one having ordinary skill in the art to substitute NP-40 into the teaching of Liu et al., because its properties are nearly identical to that of TX-100. Applicant respectfully disagrees with this assertion.

In addition to the disclosure noted by the Examiner, the Sigma Product Sheet further indicates that TX-100 is also similar in structure to Igepal CA 630, but that "these two detergents

are NOT considered to be functionally interchangeable in most applications" (see page 2 of the Sigma Product Sheet). Since TX-100 cannot be considered functionally interchangeable with Igepal CA 630, it is unreasonable to assume that NP-40 would likely have nearly identical properties as TX-100. Rather, one skilled in the art would likely come to the opposite conclusion based upon the disclosure of the Sigma Product Sheet, namely, that NP-40 is not considered to be functionally interchangeable in most applications with TX-100. Accordingly, claims 1 and 7 are considered allowable over Liu et al. in view of the Sigma Product Information Sheet for TX-100, and the Examiner is requested to withdraw the rejection of these claims as being obvious in view of these references.

Shibuta discloses a method of disentangling hollow carbon microfibers or carbon fibrils and dispersing the microfibers, where the microfibers are treated with strong acids containing sulfur, such as sulfonic acids. In rejecting claims 1, 15 and 16 as being obvious in view of Shibuta, the Examiner asserts that, although Shibuta does not explicitly teach single walled carbon nanotube structures as recited in the claims, it would appear that some single walled carbon nanotubes may be in Shibuta given that there is a disclosure of microfiber diameters as small as 3.5 nm. The Examiner further asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to use single-walled nanotubes as they also are found in ropes and agglomerates. Applicant respectfully disagrees with this assertion.

Contrary to the Examiner's assertion, the graphite-based hollow microfibers described in Shibuta are multi-walled and thus different from the single walled carbon nanotube structures that are recited in the claims of the subject application. In particular, Shibuta discloses (Col. 4, lines 9-17) that preferred hollow carbon microfibers are carbon fibrils described in U.S. Patent No. 4,663,230 to Tennent. The Tennent patent discloses (see Abstract of Tennent) a carbon fibril with a substantially constant diameter between about 3.5 and 70 nm and an outer region of multiple layers of ordered carbon atoms, with the layers being disposed substantially concentrically about the cylindrical axis of the fibril.

Shibuta further discloses that a particularly preferred carbon microfiber is sold under the trademark Graphite Fibrils by Hyperion Catalysis International (see Col. 4, lines 18-20 of Shibuta). A review of the website of Hyperion Catalysis (at www.fibrils.com) clearly indicates that its FIBRIL™ nanotubes are multi-walled carbon tubes. Copies of relevant pages downloaded from the Hyperion Catalysis website that describe the FIBRIL™ nanotubes are

enclosed in the Appendix attached herewith. In contrast, single walled carbon nanotube structures are formed by a single layer of carbon atoms in a crystalline lattice structure.

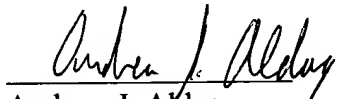
Clearly, the multi-walled carbon microfibers of Shibuta are different from the single walled carbon nanotube structures recited in the claims of the subject application. It is further unreasonable to assume, as the Examiner asserts, that it would have been obvious to one of ordinary skill in the art at the time of the invention to use single walled carbon nanotubes in the process of Shibuta, since there is no disclosure or suggestion in Shibuta that the process could be readily applied to anything other than multi-walled carbon microfibers. Accordingly, claims 1, 15 and 16 are considered allowable over Shibuta, and the Examiner is requested to withdraw the rejection of these claims in light of this reference.

In view of the foregoing, Applicant respectfully requests the Examiner to find the application to be in condition for allowance with claims 1, 2, 4, 5 and 7-20. However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to call the undersigned attorney to discuss any unresolved issues and to expedite the disposition of the application.

Submitted concurrently herewith in a separate paper is a Proposed Correction to the Drawings. The Examiner is requested to indicate whether the proposed drawing corrections are accepted in the next communication.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 05-0460.

Respectfully submitted,



Andrew J. Aldag
Registration No. 40,483

EDELL, SHAPIRO & FINNAN, LLC
1901 Research Boulevard, Suite 400
Rockville, Maryland 20850-3164
(301) 424-3640

Hand-Delivered: May 28, 2003